

We claim:

1. A communication system, comprising:

a mobile unit operative to transmit periodic channel condition indicator signals, each indicator signal including information relating to a signal to noise ratio being experienced by the  
5 mobile unit; and

a base station operative to transmit data to the mobile unit, the base station being operative to receive the indicator signals from the mobile unit and generate a channel condition prediction reflecting a channel condition expected to be experienced by the mobile unit, the channel condition prediction being based on a balanced estimate using the most recent channel  
10 condition indicator value and a mean of past channel condition indicator values.

2. The system of claim 1, wherein the channel condition prediction assigns a greater emphasis to the mean of past channel condition indicator values during rapidly changing channel conditions and a greater emphasis to the most recent channel condition indicator values during more slowly changing channel conditions.

15 3. The system of claim 2, wherein the channel condition prediction is computed by assigning a weight to the most recent channel condition indicator value and the mean of past channel condition indicator values, the relative weights being influenced by the rate of change in the channel condition.

4. The system of claim 3, wherein the weights assigned to the most recent channel  
20 condition indicator value and the mean channel condition indicator value depend on a gradient of past channel condition indicator values.

5. The system of claim 4, wherein the mobile unit transmits a channel condition indicator to the base station at each timeslot, a timeslot being a time period during which communication takes place, as defined by a standard under which the system operates, and  
25 wherein the base station receives a channel condition indicator value during each timeslot, the base station maintaining an average of channel condition indicator values, the base station

computing a channel condition prediction during each timeslot, each channel condition prediction reflecting an expected channel condition expected to prevail at the mobile unit a specified number of timeslots in the future from the most recent channel condition.

6. The system of claim 5, comprising a plurality of mobile units, each transmitting  
5 periodic channel condition indicators to the base station, wherein the base station computes periodic channel condition predictions for each mobile unit and uses the future channel condition predictions to select a mobile unit for service and to select a codeword size for transmission to each mobile unit.

7. A base station for communicating with a plurality of mobile units, comprising:  
10 an air interface for receiving transmissions from the mobile unit, periodic ones of the transmissions including a channel condition indicator providing information relating to a signal to noise ratio being experienced by the mobile unit; and

a predictor for receiving channel condition indicator values and generating future channel condition predictions reflecting a future channel condition expected to be experienced by each  
15 mobile unit, each of the future channel condition predictions being based on a balanced estimate using the most recent channel condition indicator value for the mobile unit and a mean of past channel condition indicator values for the mobile unit.

8. A predictor for generating a channel condition prediction for each of a plurality of mobile units, comprising:

20 a data interface module for retrieving channel condition indicators, each channel condition indicator reflecting past channel conditions experienced by one of the plurality of mobile units; and

a computation module for computing a mean channel condition indicator value for each mobile unit, based on a mean of channel condition indicators associated with the mobile unit and  
25 for generating a channel condition prediction based on a balanced estimate using the most recent channel condition indicator value and a mean of past channel condition indicator values.

9. The predictor of claim 8, wherein the computation module assigns a greater emphasis to the mean of past channel condition indicator values during rapidly changing channel conditions and a greater emphasis to the most recent channel condition indicator values during more slowly changing channel conditions.

5 10. The predictor of claim 9, wherein the computation module employs the mean channel condition indicator value, the most recent value and additional recent values to generate the channel condition prediction.

11. A method of channel condition prediction, comprising the steps of:  
receiving and storing a succession of channel condition indicators from each of a plurality  
10 of mobile units, each channel condition indicator received from a mobile unit reflecting a channel condition reflected by the mobile unit; and  
generating a channel condition prediction for a time of interest for each mobile unit, each channel condition prediction reflecting a balanced estimate using the most recent channel condition indicator value and a mean of past channel condition indicator values.

15 12. The method of claim 11, wherein each channel condition prediction reflects a greater emphasis on the mean of past channel condition indicator values during rapidly changing channel conditions and a greater emphasis on the most recent channel condition indicator values during more slowly changing channel conditions.

20 13. The method of claim 12, wherein the step of generating the channel condition predictions includes assigning a weight to the most recent channel condition indicator value for each mobile unit and the mean of past channel condition indicator values for each mobile unit, the relative weights being influenced by the rate of change in the channel condition.

25 14. The method of claim 13, wherein the weights assigned to the most recent channel condition indicator value and the mean channel condition indicator value depend on a gradient of past channel condition indicator values.

15. The method of claim 14, further comprising a step of managing data transmission using the channel condition predictions.